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INTERACTION ANALYSIS AS A FEEDBACK SYSTEM IN TEACHER PREPARATION.

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FOUR GROUPS OF 15 STUDENT TEACHERS EACH WERE USED TO TEST THE HYPOTHESIS THAT (A) THOSE TAUGHT INTERACTION ANALYSIS WOULD BE MORE INDIRECT (ACCEPTING OF PUPIL FEELINGS AND IDEAS, ENCOURAGING, QUESTIONING) AT THE END OF STUDENT TEACHING THAN THOSE TAUGHT LEARNING THEORY, AND (B) AMONG THOSE TAUGHT INTERACTION ANALYSIS, THOSE SUPERVISED BY INTERACTION ANALYSIS TRAINED COOPERATING TEACHERS WOULD BE MORE INDIRECT THAN THOSE SUPERVISED BY LEARNING THEORY TRAINED COOPERATING TEACHERS. CRITERION MEASURES CONSISTED OF--THE DEPARTMENT OF SECONDARY EDUCATION TEST (PRE- AND POSTTESTS), RATINGS OF COLLEGE SUPERVISORS, RATINGS BY IMPARTIAL OBSERVERS AND INTERACTION ANALYSIS TRAINED OBSERVERS, THE STUDENT PERCEPTION OF TEACHER INFLUENCE SCALE, THE TEACHING SITUATION REACTION TEST (PRE- AND POSTTESTS), AND THE ROKEACH DOGMATISM SCALE. INCOMPLETE DATA SUGGESTS THAT STUDENT TEACHERS TRAINED IN INTERACTION ANALYSIS--TALKED LESS IN THE CLASSROOM, WERE MORE INDIRECT IN USE OF MOTIVATING AND CONTROLLING BEHAVIORS, WERE MORE INDIRECT IN OVERALL INTERACTION PATTERNS, USED MORE EXTENDED, INDIRECT (AND LESS EXTENDED DIRECT) INFLUENCE, USED MORE EXTENDED ACCEPTANCE OF STUDENT IDEAS. STUDENT TEACHERS WHOSE COOPERATING TEACHERS LEARNED INTERACTION ANALYSIS USED LEAST EXTENDED DIRECT INFLUENCE. PAPER REPRINTED FROM RATHS, JAMES AND LEEPER, ROBERT R. (EDS.), "THE SUPERVISOR--AGENT FOR CHANGE IN TEACHING," ASCD PUBLICATION, WASH., D.C. (AF)

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Interaction Analysis as a Feedback System in Teacher Preparation

Edmund J. Amidon
and Evan Powell

MANY educators and social scientists have pointed out that supervision is primarily a social process which involves interaction between two or more people. The most important elements of the supervisory relationship appear to be concerned with the ability of supervisors to communicate effectively with teachers. Educators have spoken these words for many years and yet little systematic research has been focused on the study of the supervisory process.

Any study of the improvement of teaching through supervision seems to necessitate a focus on three problem areas:

1. The interaction of the teacher and supervisor as they attempt to discuss what the teacher is doing and how he can improve.

2. The description of interaction between teacher and class which serves as the basis of the supervisory conference.

3. The social skills involved in any group situation, whether it is in a conference, a classroom, or a faculty meeting.

Principles

In order to work on all three of these problems simultaneously, several principles have been examined and used as guideposts in the development of the study reported in this paper.

1. The supervisor must be given a *tool* for assessing the effects of his own behavior on the teacher or student teacher.

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This tool was provided by training a group of cooperating teachers in the use of Flanders' System of Interaction Analysis. The teachers were asked to think about the way they interacted with their student teacher while they were having a conference following a classroom observation.

The cooperating teachers were also exposed to role playing situations which allowed them to receive feedback about the extent to which they were producing defensiveness in the student teacher. For these purposes, some of the categories proposed by Blumberg were used.

2. The supervisor must have a *tool* available for objectively describing what the teacher or student teacher does in the classroom.

In order to satisfy this need, each cooperating teacher was given about twenty hours of training in the use of Interaction Analysis. The cooperating teachers were asked to have five conferences during the semester with their student teacher. At this time they would present the student teacher with an interaction matrix.

3. Feedback is essential to the improvement of both teaching and supervisory skills.

This principle was made operational through the use of the interaction matrix. This matrix summarized the data collected through the use of the ten-category system of Interaction Analysis. This matrix enables a teacher to determine how much he talks, how he responds to student talk, and what happens after he asks a question. In one sense the matrix helps a teacher to determine whether or not his teaching intentions are met.

4. Both teachers and supervisors must be free to experiment with those skills which they wish to improve.

This can only be done through providing the appropriate environment in the school and classroom. This is the reason for the training of cooperating teachers. Still, structured role playing enables teachers and supervisors to try out those behaviors which seem to be important to the improvement of their teaching and supervisory skills.

5. The direction of improvement must be arrived at by the teacher with the help of his supervisor.

Implementation of procedures in accordance with this principle resulted in a rather structured approach to the supervisory conference. All cooperating teachers were asked to present the interaction matrix to their student teacher and then let the student teacher decide in which ways he would like to change.

Interaction Analysis

Interaction Analysis has been mentioned here several times, yet not everyone is familiar with it. The Flanders System of Interaction Analysis is an observational procedure which can be used to classify the verbal behavior of teachers and pupils. Using this system, verbal behavior in the classroom is classified into ten category designations. There are seven categories for teacher behavior, four of which are classified as indirect influence. They are: (1) accepting pupil feeling, (2) praising or encouraging, (3) accepting pupil ideas, (4) asking questions. There are three categories of direct teacher influence, which are: (5) giving information or opinion, (6) giving directions, and (7) criticizing. Two categories of pupil talk are used in the system: (8) pupil response to the teacher, and (9) pupil initiated talk. Category 10 is used to indicate silence or confusion. These categories are summarized in Figure 1.

A trained observer notes every verbal behavior as it occurs, and if it persists, puts down the same number every three seconds until there is a change. After a lesson has been categorized, the data collected by the observer must be summarized so that it can be interpreted. This is done by entering the category numbers in the form of tallies into a 10-row by 10-column table called a matrix. The completed matrix gives the observer a picture not only of the percentage of interactions falling in each category but also of the general sequence of responses. Although an exact representation of the sequential time element of the entire lesson is not shown, recording the numbers in the matrix in an overlapping fashion preserves the sequential time element of adjacent numbers. Thus, the researcher might note that praise followed student response about 10 percent of the total lesson time and yet be unable to extract from the matrix whether the praise occurred during the first or last fifteen minutes of the particular lesson. For specific information about sequence the observer relies on his raw data which was initially recorded in a column. The following example is offered to help clarify the use of the matrix.

Suppose that after the observer enters the classroom the following sequence of events takes place. The teacher starts by saying, "Boys and girls, sit down in your seats and take out your workbooks" (category 6). Bill, one of the brighter children, responds to this by saying, "But, Mrs. Adams, I thought you said we were going to have a story this morning" (category 9). The teacher then reacts to Bill by saying, "Bill, you know that you were so noisy today that I decided to punish you by

Teacher Talk	Indirect Influence	1.* *Accepts feeling:* accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included. 2.* *Praises or encourages:* praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "uhhuh?" or "go on" are included. 3.* *Accepts or uses ideas of student:* clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five. 4.* *Asks questions:* asking a question about content or procedure with the intent that a student answer.
	Direct Influence	5.* *Lecturing:* giving facts or opinions about content or procedure; expressing his own idea; asking rhetorical questions. 6.* *Giving directions:* directions, commands, or orders with which a student is expected to comply. 7.* *Criticizing or justifying authority:* statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
Student Talk		8.* *Student talk-response:* talk by students in response to teacher. Teacher initiates the contact or solicits student statement. 9.* *Student talk-initiation:* talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
		10.* *Silence or confusion:* pauses, short periods of silence, and periods of confusion in which communication cannot be understood by the observer.

Figure 1. Categories for Interaction Analysis[1]
(Minnesota, 1959)

[1] Edmund J. Amidon and Ned A. Flanders. *The Role of the Teacher in the Classroom: A Manual for Understanding and Improving Teachers' Classroom Behavior.* Minneapolis, Minnesota: Paul S. Amidon & Associates, Inc., 1963. p. 12.

* There is *no* scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate, not to judge a position on a scale.

making you work in your workbooks. I don't like it when you forget these things, Bill" (category 7).

(The observer records two 7's in a row because of the length of the statement.) Then the teacher continues, "Now I think we can forget about the story and get to work in the workbooks. If we do a good job then we will have the story tomorrow." (The first part of the teacher's statement is a 6 and the last part, a 5.) The observer has recorded the following column of numbers, pairing them as shown below:

$$\begin{bmatrix} 6 \\ 9 \end{bmatrix} \begin{bmatrix} 7 \\ 7 \end{bmatrix} \begin{bmatrix} 6 \\ 5 \end{bmatrix}$$

These numbers are then entered into a matrix in sequence pairs in such a way that each number is entered twice, once as the first and once as the second number in each pair. The rows of the matrix represent the first number in the pair and the columns, the second. For example, the first sequence pair, 6-9, would be tallied in the cell that is located at the intersection of row 6 and column 9. The next pair is entered in cell 9-7, the third pair 7-7, into the cell located at the intersection of

First Event \ Second Event	1	2	3	4	5	6	7	8	9	10	TOT.
1											
2											
3											
4											
5											
6					1				1		2
7						1	1				2
8							1				1
9											
10											
TOT.					1	1	2		1		

Figure 2. Sample Matrix

row 7 and column 7; etc. Figure 2 shows the actual location of these five tallies in the matrix.

The Study

Objectives

Of course any program, if it is to be replicated, must be part of a research design and have the appropriate controls built into it. The present study is designed as a two-and-a-half year study to test the relationships between the training of cooperating teachers and certain course content, and the behavior and attitudes of student teachers.

The study tests the following hypotheses:

1. Student teachers taught Interaction Analysis are more indirect at the end of their student teaching experience than student teachers not so taught.

2. Student teachers who are taught Interaction Analysis and are supervised by cooperating teachers trained in Interaction Analysis are more indirect at the end of student teaching than student teachers not receiving such training and supervision.

Procedures

General Design. There are two important variables: student teaching course content and the training of the cooperating teacher. The course content for student teachers consists of either traditional learning theory or Interaction Analysis. The cooperating teacher is trained in the use of Interaction Analysis as an observational technique, or receives training in learning theory.

This design makes it possible to treat the influence of two independent variables: the training of cooperating teachers and student teaching course content, upon the dependent variables: ratings of student teachers' teaching effectiveness, attitudes of student teachers, pupil perception of student teacher change, and student teachers' teaching patterns. The four groups are compared with one another to determine whether student teaching course content or the training of the cooperating teacher or a combination of the two has the most significant influence on the dependent variables. The study will be carried on for five successive semesters in order to provide for replication of the experiment.

Group I. Student teachers in this group are taught Interaction Analysis in a two hour a week lecture and a two hour a week laboratory. In addition, they have a two hour a week seminar with their college

supervisor in which they can discuss problems they are having in their teaching. The cooperating teacher, using Interaction Analysis, observes the student teacher formally once a week for 30 to 40 minutes, and spends one hour a week discussing the observation with the student.

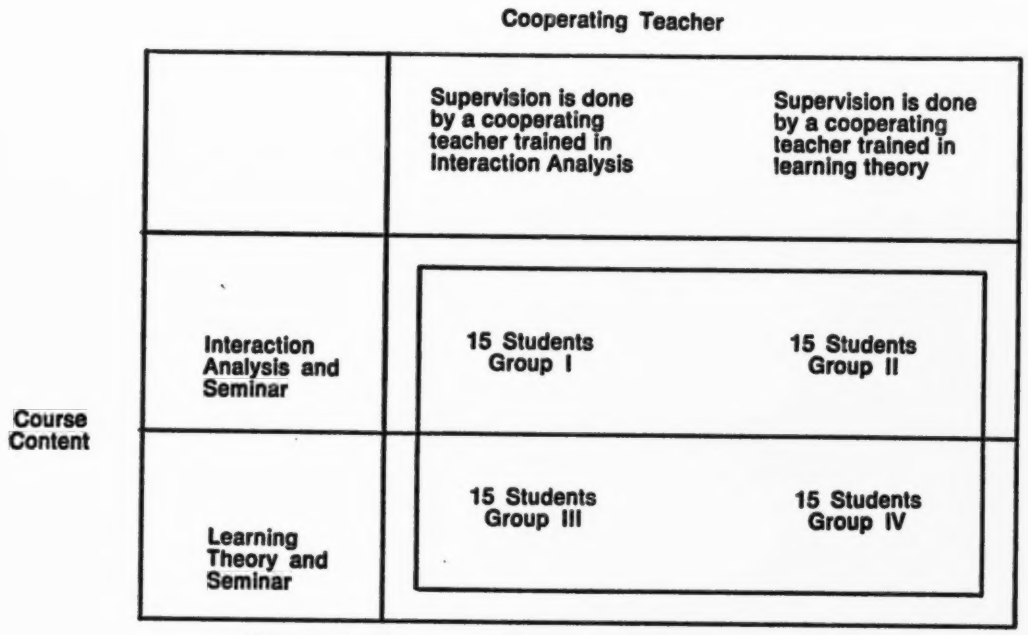
Cooperating Teacher
Supervision is done by a cooperating teacher trained in Interaction Analysis
Supervision is done by a cooperating teacher trained in learning theory
Course Content
Interaction Analysis and Seminar
15 Students Group I
15 Students Group II
Learning Theory and Seminar
15 Students Group III
15 Students Group IV

Figure 3. The Four Experimental Groups

Group II. Student teachers in this group are taught Interaction Analysis in a two hour a week lecture and a two hour a week laboratory. In addition, they have a two hour a week seminar with their college supervisor in which they can discuss problems they are having in their teaching. The cooperating teacher observes the student teacher formally once a week for 30 to 40 minutes, and spends one hour a week discussing the observation with the student.

Group III. Student teachers in this group are taught learning theory in a two hour a week lecture and a two hour a week laboratory. In addition, they have a two hour a week seminar with their college supervisor in which they can discuss problems they are having in their teaching. They are also observed formally for 30 to 40 minutes once a week by their cooperating teacher, who spends one hour a week discussing the observation with them. Although the cooperating teacher may use Interaction Analysis in his observation, he is clearly instructed not to discuss this tool or any of its terminology with the student teacher under any circumstances.

Group IV. Student teachers are taught learning theory in a two hour

a week lecture and a two hour a week laboratory period. In addition, they have a two hour a week seminar with their college supervisor in which they can discuss problems they are having in their teaching. The cooperating teacher observes the student teacher formally once a week for 30 to 40 minutes, and spends one hour a week discussing this observation.

Research by Hough and Amidon (12), Zahn (16) and Kirk (13) indicates that twelve to thirty hours of training in Interaction Analysis affects the behavior and/or attitudes of student teachers. The present design which includes 105 hours of training in and application of Interaction Analysis therefore appears to be adequate.

Population and Sample

Approximately 60 student teachers will be involved in the experiment during each of five semesters, all of them participating in their second student teaching experience. The student teachers are assigned to experimental groups according to a randomized block design. Student teachers are assigned in equal numbers to the four conditions on the basis of the socioeconomic areas in which they do their student teaching, grade level taught and subject matter taught. One of the particular problems in the student teaching assignment at Temple University is the large number of placements in the "culturally deprived" areas of Philadelphia. By using this type of design, an attempt is made to control the influence on the results of this variable of the variable of differences in school settings.

The student teachers are all students in the Department of Secondary Education at Temple University. Nearly all of the students are residents of Philadelphia. Approximately fifty percent of the student teachers are girls. The four groups are compared on the basis of personality, attitudes, and college grades, in order to determine the influence of these variables.

Data and Instrumentation

Student teaching rating. Student teachers are rated at both the beginning and end of their student teaching experience by the same measuring instrument which the Department of Secondary Education normally uses to rate student teachers. Student teachers are rated by both their college supervisors and by impartial observers not involved in supervision. The impartial observers do not know which student teachers are in which of the four experimental groups.

Student teaching behavior. The Flanders System of Interaction Analysis is not only taught to student teachers, it is also used to assess changes in behavior that may take place over the semester. Each student teacher is observed for two hours at the beginning of the semester and for two hours at the end of the semester by a trained observer using the Flanders system. These observers are not the college supervisors and do not know which student teachers are in which of the four experimental groups.

Student teaching rating by pupils. The Student Perception of Teacher Influence Scale is used to assess the perception that the children have of their student teacher's behavior. The data are gathered on a nine point scale, and are analyzed statistically. This instrument was used initially by Amidon (2) and Anderson (4) with secondary school pupils, and has been adapted for use in the elementary school by Kirk (13). Both Amidon and Anderson report high reliability for this instrument.

Student teacher attitude. The Teaching Situation Reaction Test is used to assess student teacher attitudes. In general this test measures the student teacher's reaction to a classroom situation in terms of the direct-indirect dichotomy. A student teacher with a low score sees himself reacting fairly indirectly to a classroom situation, while a high score indicated a more direct reaction. Hough and Amidon (12) present information concerning the validity of the instrument. They found a split half reliability of .94 for the test. This test is given both at the beginning and end of the student teaching experience.

Student teacher personality. Rokeach's Dogmatism Scale is used to measure personality. A discussion of the test construct and validation procedure are available in Rokeach's *The Open and Closed Mind* (15). The aspect of personality measured by the test is the openness or closedness of a person's belief system.

Results and Conclusions

The results of the present study must be interpreted in the light of the early work which was done by Flanders and his associates.

Interaction Analysis was developed and refined by Flanders in the early 1950's. The early research on Interaction Analysis was designed to relate children's attitudes to patterns of teacher behavior. Flanders found that pupils of teachers who were observed to be indirect had more positive attitudes than pupils of teachers who were perceived by observers as being direct. These findings indicated that pupils of indirect teachers were more interested in subject matter and liked the methods

used by their teachers better than did students of direct teachers (9: 10).

The results of this early research support the validity of Interaction Analysis as a procedure for predicting the general attitudes of children in a particular classroom.

The next research effort undertaken by Flanders and his associates was designed to determine the relationship between teacher behavior and student achievement. Several large studies were conducted both in a controlled laboratory setting and in normal classroom situations. All of these studies were carried out at the junior high school level and involved the teaching of social studies and mathematics.

In the first of these studies, Amidon and Flanders (2) found that dependent-prone eighth grade students who were taught geometry by indirect teaching methods learned more than dependent-prone children taught by direct methods.

In a large scale study, Flanders (9) isolated, for purposes of analysis, junior high school teachers whose pupils learned the most and the least after a two week experimental program in social studies or mathematics. Teachers of the higher achieving classes were found to differ from teachers of the lower achieving classes in the following ways: (a) they used five to six times as much acceptance of student ideas and encouragement of student ideas, (b) they used five to six times less direction and criticism of student behavior, (c) they talked ten percent less, and (d) they encouraged two to three times as much student-initiated talk.

Similar results to those found by Flanders between teachers of high achieving pupils and those of low achieving pupils were found by Amidon and Giammatteo when they compared 30 superior teachers with 150 randomly selected teachers in elementary schools. The 30 superior teachers were nominated by their supervisors and administrators (3).

Since all of this research appeared to have implications for teacher education, Flanders instituted an in-service program in which Interaction Analysis was taught as an observational tool. The in-service program was able to effect observable changes in teacher patterns of verbal behavior. In general, at the end of the experimental in-service program, these teachers evidenced more encouraging and accepting behavior and were less critical and more indirect than they had been at the beginning of the experiment (10).

Kirk conducted a study with student teachers in elementary education in which he taught Interaction Analysis to an experimental group and compared this group with student teachers who had no Interaction Analysis. He found that the experimental group talked less, had more pupil-initiated talk, and more often accepted pupil ideas than did student

teachers in the control group (13). Zahn found that student teachers who learned Interaction Analysis developed more positive attitudes toward student teaching than did a control group of student teachers who were not taught Interaction Analysis (16).

Little, if any, systematic research has been done on the training of cooperating teachers to supervise student teachers. However, the recent work of Medley and Mitzel (14) and Zahn (16) does suggest that there is a relationship between the behavior and attitudes of cooperating teachers and growth in student teaching. While they found that the effect of the college supervisor on the student teacher was slight, the influence of the cooperating teacher and the classroom situation appeared to be great.

Much of the data from the present study is still not analyzed. However, the direction indicated by the early analysis is significant because of the consistency of the findings. When comparisons were made at the end of the semester between the student teachers who learned Interaction Analysis and those who did not, the following results were obtained:

1. Student teachers who knew Interaction Analysis talked less in the classroom than those who were trained in learning theory.

2. Student teachers who learned Interaction Analysis were more indirect in their use of motivating and controlling behaviors than those who were trained in learning theory.

3. Student teachers who were taught Interaction Analysis were more indirect in their overall interaction patterns than student teachers who were trained in learning theory.

4. Student teachers who were taught Interaction Analysis used more extended indirect influence than student teachers who were trained in learning theory.

5. Student teachers whose cooperating teachers learned Interaction Analysis used less extended direct influence than student teachers who were trained in learning theory.

6. Student teachers who were taught Interaction Analysis used less extended direct influence than student teachers who were trained in learning theory.

7. Student teachers who were taught Interaction Analysis used more extended acceptance of student ideas than student teachers who were trained in learning theory.

Perhaps the most significant implications of the early results of the continuing study are that they are consistent with, and support the

previous work which has been done on the effect of Interaction Analysis on student teachers, as well as the earlier studies on the relationship between Interaction Analysis patterns and student attitudes and achievement.

In general, when student teachers are trained in Interaction Analysis they become more indirect, accept more student ideas, and criticize less than student teachers not so trained. Since Flanders found that teachers of children who had high achievement and positive attitudes were more indirect, accepted more student ideas, and used less criticism than teachers of children with low achievement and negative attitudes, there appears to be substantial evidence that the Interaction Analysis training is helping to produce teachers with appropriate teaching skills.

Implications

Perhaps the best estimate of the role of Interaction Analysis in the supervisory process is that it provides a basis for what might be termed the "self-directed supervisor." With Interaction Analysis the supervisor does not need to point to the teacher and give him directions for changing his behavior; the teacher can see this in the matrix. The teacher can observe himself, using a tape recorder and thus provide his own feedback without the presence of another person. While many teachers find the use of Interaction Analysis threatening at first, many also find it refreshing to be able to have objective data that they can study and thus make their own decisions about how they would like to change.

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